THE

ADVOCATE OF SCIENCE,

AND

ANNALS OF NATURAL HISTORY.

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MOBILE, ALABAMA. By T. A. CONRAD.

From the Note Book of a Traveller.

THE vicissitudes of climate are even more remarkable in the southern than the northern states in winter, and the frosts of night are generally succeeded by a noon-day as mild as any in the vernal months. In December, I took passage at Claiborne in a steamboat for Mobile. The weather was so unusually cold that the shores were covered with ice, and immense icicles, like stalactites, hung from the terraces of the elevated cliffs. The morning was clear and frosty, and the blue vapor, first curling in fantastic wreaths over the bosom of the stream, ascended to the branches of the trees, which, together with the shrubs on the margin of the river, were, by the beautifying agency of frost, arrayed in a silvery mantle that threw a charm over the melancholy aspect of a defoliated forest. Even the Tillandsia seemed to enjoy the saturnalia of winter, and waving from the supporting arm of its parent tree, swept the ground with its fairy net work of silver. On my arrival at Mobile, I found the streets and roofs of the houses coated with ice, and the chilly air, with the absence of leaf and flower, together with the blooming and northern faces I observed in the streets, reminded me more of a town in the north than a city within a few hours sail of the Mexican Gulf. The vast quantity of cotton, however, tended to restore the reality, and to

remind me that I was in a clime where the storms of winter are brief, and rarely congeal the surface of the shallow pool; where the hoar frost of night is dissipated by the earliest ray of the sun, and the flower and butterfly enjoy the genial warmth of the winter's noon. The month of February came on with a vernal temperature, calm and clear as the parting hour of May; the broad expanse of Mobile bay was an unbroken mirror, occasionally darkened here and there by some broad winged bird; or perhaps the wild duck skimmed and plashed along the surface, leaving a long train of silvery light behind. The larger grackles were also adding to the animation of the scene, and feeding from the water while on the wing, like the untiring gull. The meadow lark and other birds were singing, and the violets were blooming on the road side, while the bushes were starting into verdure beneath the beams of the life-giving sun. The gray lizard, without a trace of his wonted activity, was lazily basking himself in the sunshine upon the decaying log or prostrate tree, which was half buried in the arid and herbless sand.

Choctaw point, below the city, commands a fine view of the noble bay of Mobile, with the distant sail and numerous vessels at anchor, as the channel is too shallow to admit the passage of the larger class of ships; extensive flats of sand and mud are here exposed at low tide, and are covered with the remains of those giant trees of the forest which the freshets and storms of winter have swept from the borders of the Alabama and other rivers, which pour their collected waters into the bay. Here, in spring, vast numbers of the crabs called fiddlers run along the sand, in search of food, each elevating his threatening and formidable claw; whilst the salamander may be seen quietly gliding, without fear, among his crustaceous neighbors, yet carefully avoiding actual contact with them. The most interesting inhabitant of the flats, is a bivalve shell-fish, (Rangia *cyrenoides*,) which lives about three inches below the surface, and affords no other token of its presence than a simple depression in the sand; this shell inhabits, in vast numbers, the margins of all the bays and lagoons of the Mexican Gulf, where the water is potable or merely brackish; and it is

evident that a vast tract of low level land, the northen border of the Gulf, was at no distant geological period, the bed of a chain of lagoons, similar to those at present existing, inasmuch as this tract is a deposit of the same bivalve shell, covered by a superficial layer of sand and vegetable mould. Before this line of coast was upheaved by volcanic agency, the islands or marshes opposite Mobile were entirely submerged, as was also the plain on which the city is built, and the bay of Mobile then extended, with many shoals but no islands, quite to the confluence of the Tensaw and Mobile rivers. There was then an uninterrupted sheet of water between the present scites of Mobile and Blakely, a distance of twelve miles across the bay, and the western shore was consequently more exposed than at present to the easterly winds, which would throw up the sand in heaps or undulations, as we observe the same phenomenon on all unprotected and low sand shores. In this manner were formed alternate ridges of sand, now shaded by lofty pines, and depressions, at present small tracts of swampy soil, covered with a luxuriant growth of trees and shrubs.

The changes which have been effected by time and the secret operations of nature; the origin and destination of man, as well as of all the various tribes of animated beings, are speculations which wing the spirit with etherial pinions, and then bear it away into a fairy realm of imagination, where, haply, it may sometimes sport on the confines of truth. Here, where once rolled the waves of a fathomless ocean, familiar alone to the eye of some lost sea bird, and which the prow of a bark never ploughed; here, succeeding ages witnessed, in place of the dark waste of interminable waters, the calm surface of a shallow bay, in which the purity of heaven was mirrored whenever the winds paused in their wild career. Another age gave birth to a pine forest, after the elevation of the land had forced the waters to retire, and the flower, the bird, and the insect, soon added beauty and animation to the scene. Then came the giant inhabitants of woods and savannahs, the Mastodon, Megalonyx, Megatherium, and many other quadrupeds anterior to man, whose giant forms almost realized the fictions of the ancients, and whose remains, sole record of their exist-

ence, furnish the mind with new illustrations of the difficult history of creation, and the imagination with many a strange vision of the mysterious and mutable past. A change came over the earth, and then succeeded the savage, in all the wildest features of uncultivated nature; the man whose iron nerves bade defiance to torture; whose firm eye was never dimmed by tears; the stoic of the wilderness, with passions as rude as those of the beasts which sported around him, beneath the green arches of the forest of pines. Around his rude hut, the mocking-bird displayed his untiring activity, and wasted on slumbering sensibility the sweetest language of affection that ever sprung from aught but a human love, since the fierce passions were tamed into gentleness, and the cultivated mind lighted the eye with the beam of intelligence, and moulded the form and the features into beauty and grace. Over the savage supremacy the arts of civilization exalted the European, and the Indian was subdued; he became more degraded, and although he concealed the stubborn energy of his unconquerable passions, his nature remained the same; and even now he walks the streets of a city, surrounded by beauty and wealth; the artificial glitter and the luxuries of life; but his cold eye surveys them all with apathy, and his untutored spirit rejects their influence with disdain. He flies again to his home in the forest, and beneath the rude shelter of his bark hut, when his hunger is satisfied by coarse and scanty food, passes his time in joyless indolence, without a hope or a fear to stir the utter stagnation of his soul.

And now a portion of the forest is swept away, a city is built which is rapidly rising in wealth and population, and the products of a vast extent of country are by the agency of steam propelled along the bosoms of noble rivers; the native is gradually retiring from a scene so uncongenial to his spirit, and ere long he will disappear altogether from this region, like the bison, and at last even from the cognizance of civilized man.

In the vicinity of Mobile, numbers of Indians of both sexes cut firewood of the pitch pine in the form of staves, which they bind between four pieces of hickory, and the whole has a miniature resemblance to a pannel of rude board fence; this is

strapped on the back; and sometimes when a female owns it, an infant may be seen added to the load. The primitive "hewer of wood" goes from house to house until his burthen is disposed of, and the scanty pittance he receives in exchange procures him a loaf and some whiskey. Away he flies to his sylvan lodge, and when the demands of hunger are satisfied, enjoys the exciting draught. This does not fill his heart with gaiety, nor flatter his imagination with the airy joys of romance; no bacchanalial song of exultation bursts from his sullen lips; all is silent, gloomy, stupid brutality. Strange that such extremes should exist in a being said to be created a little lower than the angels! The heart is called upon to do homage to external beauty,—which in imagination cannot be excelled,—to an intellect which seems the reflected mind of a divinity; and then how soon may the picture be reversed; we behold in man scarcely more than the attributes of brutes, and passions which in the darkness of ignorance are as gloomy and turbulent as a stormy sea, but alas! are never destined, like the ocean, to have their day of brightness and beauty; for the winter in their souls, we fear, will never be dispelled by the warmth of devotion, nor brightened by that sunshine of the heart which education alone can bestow.

ANSWERS TO QUERIES.

Near the conclusion of the last volume of the Advocate of Science, a number of queries were suggested, some of which were not answered, while the solution of others does not appear to be satisfactory. Of this latter kind were those that follow:

ON THE RESISTING MEDIUM.

We have received another communication from our correspondent L. H. P. upon this subject; and, as we are desirous of closing a prolonged discussion, which involves so much speculation, and so little data, we hope to be excused from giving any more than a general view of the contents of his essay.

The materiality of light and heat, the influence of electricity and the tenuity of the earth's atmosphere, all of which have been urged in the progress of this discussion, as agents which *may* have the power of generating a resisting medium, we do not consider necessarily connected with the point in question, however clearly the influence which each can exert, may have been shown. For the original proposition of our correspondent was to account for a *known*, and not a *supposed*, irregularity of the motion of the moon, or of any other body belonging to our system. This irregularity, as we have before said, has been satisfactorily accounted for, as we shall presently show; hence, we do not want two causes, or more, to assist in producing an effect, when one will in itself produce it. The influence of the above agents, therefore, must be considered abstractedly from any eccentricities which are yet known to exist in any of the planetary bodies of our system.

The eccentricity of the moon, which has been adverted to by L. H. P. is called the *secular acceleration of the moon's mean motion: secular*, because it requires an immense period of time for its consummation. A very lucid explanation is given in Herschell's Treatise on Astronomy, of the causes of all the phenomena of planetary disturbances: and while we give an abstract of this, our readers are referred to the work itself for many interesting facts, which it will not be possible to embody in this notice.

Dr. Halley, on comparing together the records of the Chaldean astronomers, of the most ancient lunar eclipses, found that the period of the moon's revolution at present is sensibly shorter than at that remote period. These comparisons indicated the increase of the moon's mean motion to be about eleven seconds per century. For a long time did this furnish a ground for theorizing, but none of the causes assigned by geometers could maintain any claims to the confidence of the practical astronomer, till the genius of La Place pointed out the real cause, which has proved to be one of the most curious and interesting problems of astronomy.

From the earliest ages, the eccentricity of the ellipse which the earth describes round the sun, has been diminishing, and

there is little reason to doubt that this diminution will continue till the eccentricity is altogether destroyed, and the earth's orbit becomes a perfect circle. After which it will again open out into an ellipse, the eccentricity will again increase, attain a certain moderate amount, and then again decrease. The time required for these revolutions has not yet been calculated further than to satisfy us, that it is not to be reckoned by hundreds or thousands of years. And it is by this variation in the eccentricity of the earth's orbit, that the secular acceleration of the moon is caused. For if the solar ellipse were invariable, the alternate dilatation and contraction of the moon's orbit would effect an exact compensation in the distance and periodic time of the moon, by bringing every possible step in the sun's change of distance to correspond to every possible elongation of the moon from the sun, in her orbit; and thus the compensation would be effected in a few centuries at furthest. But inasmuch as the solar ellipse is kept in a continual, but very slow state of change by the action of the planets on the earth, this compensation is only imperfectly effected. The steps of restoration are not equal to those of change. Thus, during the whole time that the earth's eccentricity is diminishing, a preponderance is given to the action over the reaction, and it is not till that diminution shall cease, that the tables will be turned, and the process of ultimate restoration will commence. Meanwhile a minute, outstanding and uncompensated effect is left at each recurrence, or near recurrence of the same configurations of the sun, the moon, and the solar and lunar perigee. These accumulate so as to influence the moon's periodic and mean motion, and thus becoming repeated in each lunation, at length affect her longitude to an extent not to be overlooked.

The dilatation and contraction of the lunar and planetary orbits, which arise from the action of the radial force, and which tend to affect their mean motions, are distinguished into two kinds: the one permanent, and depending on the distribution of the attracting matter in the system, and on the order which each planet holds in it; the other periodic, and which operates in length of time its own compensation. To Lagrange do we owe the important discovery, that beside these there

exists no third class of effects, whether arising from the radial or tangential forces, or from their combination, such as can go on for ever increasing in one direction, without self compensation; and in particular that the major axes of the planetary ellipses are not liable even to those slow secular changes of which the inclinations, nodes and all the other elements of the system are affected, and which, it is true, are periodic, but in a different sense from those long inequalities which depend on the mutual configurations of the planets *inter se*. Now, the periodic time of a planet in its orbit about the sun, depends only on the masses of the sun and planet, and on the major axis of the orbit it describes, without regard to its degree of eccentricity, or to any other element. The mean siderial periods of the planets, therefore, such as result from an average of a sufficient number of revolutions to allow of the compensation of the last mentioned inequalities, are unalterable by lapse of time. The length of the siderial year, for example, if concluded at this present time from observations embracing a thousand revolutions of the earth round the sun, is the same with that which must result from a similar comparison of observations made a million of years hence.

The movements of the perihelia, and variations of eccentricity of the planetary orbits, are interlaced and complicated together by laws, the nature of which cannot be here introduced. Each acts upon every other, and every such mutual action generates its own peculiar period of compensation; and every such period is thence propagated throughout the system. Thus cycles upon cycles arise, of whose compound duration some notion may be formed, when we consider what is the length of one such period in the case of the two principal planets, Jupiter and Saturn. The effect of their mutual attraction would be to produce a variation in the eccentricity of their orbits, to go through which changes it would require 70,414 years. Hence it will be easily conceived, that millions of years will have to elapse before a complete fulfilment of the joint cycle, which shall restore the whole system to its original state, as far as the eccentricities of its orbits are concerned.

From these observations, our correspondent will probably be

able to see, that so far as any irregularities of the planets composing our system are known, so far has their true cause been developed and explained by astronomers. His essay now before us gives indication of much thought on the subject: but as we said in the beginning of these remarks, the arguments are not strictly applicable to the point. It will not do to urge one speculative theory in support of another. Nothing short of *facts* can be made use of for this purpose: and that our atmosphere is infinitely elastic, we do not know to be a fact; it is theory.

In relation to the moon, moreover, we might state, that a series of careful and accurate observations has shown the *mean* eccentricity of her orbit to be the same now as in the earliest ages of astronomy. If, therefore, a resisting medium *does* exist in space, its tenuity is such as to exert no appreciable influence in retarding the planetary motions. Many believe that it does exist; and that the gradual approximation of the elliptic orbit of some comets to a circular form, is caused by the presence of such a medium. This may be so; but a subject open to such endless speculation, cannot be settled in a moment of time. The whole cycle of the solar system may be accomplished, and yet the world may be no wiser in relation to this point, than it is at present. It becomes us, therefore, while investigating the operations of nature, to reason upon what we know, and not on what we only suspect.

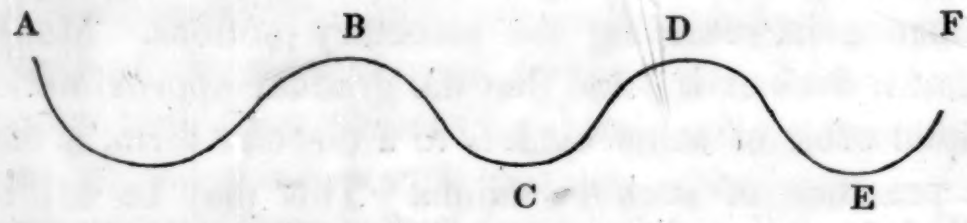
SCIENTIFIC PROBLEMS.

"It often happens that water will not flow through a leaden, or other pipe, laid with due reference to the pressure and motion of fluids, until it is forced through; or in other words, until the air is forced out by some suitable apparatus. What is the cause of this?"

Stoppage of water in Aqueducts.—The principal fact stated in the problem, "that it often happens that water will not flow through a leaden or other pipe, laid with due reference to the pressure and motion of fluids," Boreas does not deny. He must, however, be ignorant of the real character of that fact, or he certainly could not suppose his answer sufficient to ex-

plain it. A trifling and momentary resistance arising from the "dry surface of the pipe," could by no means cause the trouble often experienced. I have but little practical acquaintance with this subject; but I have never understood that there is any difficulty when the descent from the source to the mouth is uninterrupted, though ever so small. The obstruction occurs where the line of pipe is undulating, the water having occasionally to *ascend* as well as descend.

The following experiment, which I have just tried, will probably convince Boreas of his error, and perhaps that "my idea that the air in the pipe resists the passing of the water," is *not* "certainly incorrect." I took a piece of lead pipe, five feet long, and made several short, zig-zag bends in it, like the following diagram, leaving the ends A F but three and a half feet asunder.



I forced water through it several times, that there should be no "dry surface." The end A being duly elevated above every other portion of the tube, and an inch and a half above the discharging end F, I could get no water through it. At a considerably greater elevation the water would flow, provided I poured it in very rapidly; showing that if the stream was sufficiently large to carry with it nearly all the air in the high portions of the tube, (which I will soon show is liable to be confined there in larger or smaller quantities,) there was little or no obstruction. But by pouring the water slowly, not a drop would pass through at an elevation of *fifteen inches*, or more than one to three.

This experiment has suggested what I think may be the true philosophy of the thing. When the water is poured in at A it will evidently rise without obstruction to B, which, for the purpose of this illustration, we will suppose to be at a considerable distance, say twenty feet from A, and one inch below it; the water passing very slowly over the top of the curve at B, runs down in a small stream, immediately seeking and filling the

lowest point in the curve C, which we will suppose one foot below B; a certain quantity of air remains between B and C, perfectly inclosed by the water on both sides of it; the water flowing over, under a pressure of *one inch*, will accumulate at C, till it rises both ways from that point sufficiently to give the air, by compression, an extra elastic force equal to one inch of water. The air thus compressed, unlike a column of water of equal extent, presses the water back at B, just as hard, (abating its trifling weight, compared with that element,) as it presses forward the water at C. The water in the curve C will of course be one inch higher towards D than towards B. The two columns of water, although one of them is considerably more elevated than the other, pressing with equal force against the column of air, and being equally pressed by the air, will remain in a state of equilibrium. If the water is poured from B in a stream one-fourth as large as the tube, the rise in that direction, allowing for compression, might be four inches; and consequently towards D five inches. If D is more than five inches above C, no water will pass over; but if less, a small quantity will pass to E; if the quantity of air remaining in the tube be greater or less than I have supposed, there will be a corresponding elevation or depression of the column of water from C to D. Hence, by extending the downward curve C, and diminishing the stream, the obstruction may be augmented beyond any assignable limits. L. H. P.

PROCEEDINGS OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

May 20th, 1834.

Dr. Morton presented a very rare shell of the new genus Litholepas, Sow. (*Lepas dorsalis* of Linn.) specimens of which he had obtained in Barbadoes.

A report of the committee on Mr. Conrad's paper on the tertiary and recent deposits of the southern states, and an appen-

dix thereto on new tertiary fossils of the same states, in favor of publication, was read and adopted.

June 3d. The following information was elicited from members present, respecting the appearance of the periodic locust. Dr. Keagy had seen them in 1815 in the valley of the Mississippi, and in 1817 in Baltimore. Dr. R. Coates had seen them in 1818 in Burlington County, N. J., and it is said not to be found this year in the northern part of Bucks county. Dr. C. had been shown a plum tree in Germantown in a state of decay, but of which the branches perforated for the deposition of ova in 1817 have not yet fallen. Dr. Morton informed that in 1818 they were in West Chester county, N. Y. H. D. Rogers, Esq. had seen them in the eastern part of Virginia in 1827. Prof. W. R. Johnson in Rochester, N. Y. in 1831; and Dr. Keagy was informed of their presence in Westmoreland county, Pa. in 1832.

Dr. Pickering stated, that the insect had not been seen in the eastern part of New England. And that we have a rare and undescribed species nearly resembling the septendecim, and which might be confounded with it without close observation. The abdomen of the septendecim is all black, while in the undescribed one, each ring of the abdomen has a red border; the whole insect, moreover, being a little smaller than the former. From an account contained in the "Farmer and Gardener" it appears that the periodic locusts have never been seen on the mountains, either in 1832 when they were abundant west, or during their present visitation on the east side.

June 10th.—Dr. Morton presented a remarkably large species of Felis, and a specimen of *Mustela Penanti*, sent to him from Northumberland county, Pa.

Dr. Mutter presented some geological specimens from a valley and bed of a river of Caraccas.

The corresponding secretary read a paper from Dr. Hildreth containing an investigation of the history and habits of some lepidopterous insects.

June 17*th.*—Mr. Rogers read a communication in the name of Prof. A. D. Bache and himself, containing part of a series of analyses of the coals of Pennsylvania.

Mr. Rogers read a paper on the *ancient alluvium* immediately underlying the diluvium, by some referred to the plastic clay formation; but which Mr. R. supposes, from facts observed by him, to belong to a much later epoch: and that a large part of it will prove to have been deposited by great rivers at their estuaries.

Dr. Pickering exhibited a specimen of the Cicada mentioned by him at the meeting of the 3d instant, as so nearly resembling the C. *septendecim.*

July 1*st.*—The recording secretary stated that about two miles north of the city no locusts had been observed since the rain of Sunday last.

Dr. Morton stated that the multivalve shell presented by him at a former meeting under the name of *Litholepas*, is so called by mistake by M. Blainville. The true generic name given it by Mr. Sowerby is *Lithotrya.** This singular shell, which at first sight looks like an *Anatifa*, has, however, very different habits from the latter. It is, in fact, a *boring shell*, having one end fastened to the bottom of a cylindrical cavity, by a calcareous accessory valve, while the other or multivalvular extremity is free in the tube, and is retracted or protruded at pleasure: this faculty is derived from a beautiful annulated structure, composing the body of the animal. The Lithotrya inhabits the limestone rocks near low water; when the rocks are bare, it is scarcely visible in its domicil; but when the sea covers the rocks, it thrusts forth its shelly head, expands its red tentacula, and has some resemblance to a flower. Mr. Miller, an English naturalist of celebrity, first discovered these shells on the coast of Yucatan: they were subsequently found in the little island of Montserrat, and Dr. Morton, during the present year, obtained them in considerable numbers in the rocks close to the town of Bridgetown, in Barbadoes. So rarely has it

* *L. dorsalis.* Sowerby.

hitherto fallen into the hands of conchologists, that M. Blainville, in his beautiful work on shells, states that he never saw either the shell or the animal of the Lithotrya.

July 22d.—Mr. Lukens stated that in a journey through New York he had observed the temperature of a spring at the lower end of lake George, at the foot of a mountain 44°; of a well at Glenn's Fall 48°; a well and spring at Lehighton each 48°.

July 29th.—Prof. A. D. Bache made a communication respecting a new form of galvanic apparatus, invented by Mr. John W. Draper, now of Virginia, composed of two fluid and two solid elements, and possessing remarkable powers of effecting chemical decompositions with a small extent of surface. With even a single set of elements the decomposition going on during the diffusion of the liquid elements through each other. A combination of one-tenth inch surface of zinc and copper wire, (bell wire) coiled in a glass tube one-fourth of an inch in diameter, two and a half long, decomposing water. The fluid elements are a solution of chloride of sodium and dilute muriatic acid, the latter solution being made of a little lower specific gravity than the former. The solution of the chloride of sodium occupies the lower part of the tube, covers the zinc coil, and rises nearly to the lower edge of the copper; the dilute acid is then carefully added, and fills the remainder of the tube. Mr. Draper is engaged in investigating the conditions necessary to the most energetic action of this form of battery.

August 5th. Mr. Conrad read a description of a shell from the vicinity of Liberia, forming his new genus Pleiodon. This shell is one of the most remarkable of the fresh water bivalves, and excelled by none in the beauty of its nacre or interior surface. The name Pleiodon is from its great number of cardinal or hinge teeth.

Dr. Harlan exhibited leaves of the oleander, on which were insects, serving, according to the late Dr. Barton, the same purpose to which ants put the Aphis. It is a species of Coccus.

Dr. Harlan also made some remarks on varieties of copal from South America and Africa, in which, he observed, insects are found as well as in Amber. Dr. Ure has stated that insects are not found in copal, but that the gum generally known by that name is different, being the gum anime, an opinion which Dr. H. confuted.

Dr. Pickering informed the meeting of his having been advised, that the valuable bequest of the late lamented botanist, De Swheinitz, was ready for delivery. This is a very extensive herbarium, the specimens in which are in admirable preservation.

August 19.—Dr. M'Murtrie presented to the Academy the shell before mentioned, from which the new genus Pleiodon has been constructed. As it is the only specimen known to conchologists, it is accordingly a donation highly valued by those members who feel an interest in this branch of natural science.

Dr. Morton presented thirteen species of Chiton, a genus of multivalve shells, from the islands of Barbadoes, St. Thomas, and Santa Cruz, eight of which were not before in the collections of the academy, and some of them are not noticed in the systems. The species of this singular genus attach themselves to rocks, and beneath stones on the sea shore, and were formerly overlooked by collectors; within a very few years, however, the species have rapidly accumulated in the cabinets, and the genus become very extensive. No part of the world, perhaps, has furnished so large and curious specimens, or a greater variety than the Gallipagos islands.

Dr. Blanding presented four species of Terebratula, from the Oolitic series, which he obtained among ballast, brought from Bordeaux.

Dr. Pickering exhibited a specimen of the queen white ant, and two soldier ants, and made some remarks upon the species.

Dr. Ruschenberger read an extract of a letter from Dr. John Stiles of Valparaiso, describing a new species of blistering fly, producing the effect in four or five hours, attended with much pain.

Dr. Harlan mentioned that he had been blistered by rubbing an insect across his throat, the species of which was unknown to him.

Dr. M'Euen stated, that on the 15th instant, he had observed the temperature of the mineral spring at Brandywine to be 59°; the cold spring on Ridley Creek, 57°; another spring near the last, 58°; these three are at the base of hills about eighty feet high; the well at Mr. Justice's forty-five feet deep, 56°.

Sept. 2.—A large Bulimus from Rio Janeiro was presented by Dr. Ruschenberger.

Mr. T. A. Conrad read the description of a new species of Hinnita, a genus of marine bivalve shells. It belongs to the splendid cabinet of Charles A. Poulson, Esq., whose scientific treasures are well known to, and appreciated by, those who have occasion to consult specimens, and scientific works.

METEOROLGICAL OBSERATIONS,

Made at Wilmington, Delaware, by H. Gibbons, M. D.

Meteorology is a subject, the importance of which does not appear to be duly appreciated by the American public. A simple record of observations on the weather, such as the subjoined tables, when continued through a series of years, becomes very useful, and, indeed, indispensable for the settling of disputed questions with regard to change of climate. As a source of reference merely, such a record is valuable: for want of it we cannot determine with certainty the simple question whether the climate of America has ameliorated during the last century. If ever we shall be able to establish useful rules for the prognosticating of atmospheric changes, it must be by means of correct and regular records of the past. And I am inclined to believe that rules of this kind might be easily formed, did we possess the requisite data.

But without enlarging on these general views, I will proceed to introduce a few remarks explanatory of the tables which follow. The reader will perceive that three observations daily are recorded, of the thermometer and barometer. The first of these is taken about sunrise—the second at the warmest period of the day, from one to three o'clock—and the third at eleven in the evening. Great care is exercised in regard to the situation of the thermometer that it may not be influenced by the reflection of the sun's rays. It is not enough that the instrument be suspended in a shady place. It should not be open to the view of any object on which the sun is shining. If hung under a tree on a clear summer's day, the reflected heat from the surrounding objects will often raise the column of mercury from five to ten degrees higher than the temperature of the atmosphere; and hence the newspapers frequently represent the thermometer to have been above 100°, an extreme of heat which, I may safely say, is never incident to the climate of the northern and middle, and most probably the southern, states. A place sheltered from the direct and from the indirect rays of the sun, and at the same time exposed to a free circulation of air, and not heated or cooled by an adjacent wall, is the proper situation, and the only proper one, for a thermometer. To find such a spot without sometimes shifting the instrument is not practicable; and it is therefore necessary occasionally to change its situation, according to the varying circumstances of clouds, wind and so forth.

In preparing the summary which follows each monthly table, the monthly average of the thermometer and barometer is the mean of two daily observations only, the nightly observation not being taken into the account. I have adopted this course for the reason that the mean between the highest and lowest extremes of temperature on each day represents the average temperature for a series of days more accurately than can be done by multiplying the number of diurnal observations. For the sake of uniformity the average of the barometer is reckoned in the same way.

In the summary, the winds are divided into three classes, having reference not only to their direction, but also to their

character. Those winds which proceed from the quarter of the compass north of west, extending from N., to W. by N. inclusive, form the first class, being in their general character *dry* and *cold.* Those which emanate from the eastern quarter, or from the range of the compass between N. by E. and S. by E. inclusive, constitute the second class, and are *damp* and generally *cool.* The third class all those winds from S. to W. inclusive, which are always *warm*, and mostly *damp in winter* and *dry in summer.* These three classes I have distinguished by the names *Northerly*, *Easterly* and *Southerly.* The first occupy 90° of the horizon, the second 160°, and the third 110°. The first and third are land winds, and the second are from the sea.

The proportion of clear and cloudy weather is deduced from the original manuscript journal, in which I have recorded three daily observations, to wit: morning, afternoon, and evening. It often occurs that we have a considerable proportion of fair weather, and at the same time but few days that are clear throughout. In this case it is evident that the number of clear days will not fairly represent the proportion of clear weather. Hence the propriety of adopting the plan that I have chosen. The number of "whole days clear" in the summary, refers to such days as were clear from sunrise to sunset.

The direction of the upper currents of the atmosphere are indicated by the motion of the clouds; this I regard as an important part of a meteorological journal. As two strata of clouds are often visible at the same time, two columns are allotted to this part of the register. When a single current or stratum of clouds exists, its course is denoted always in the former of the two columns; and whenever there are two currents, the former column refers to the higher, and the latter to the lower current.

JOURNAL OF THE WEATHER FOR MARCH, 1834.*

Days mo.	Ther. Sunrise	Ther. Mid-day	Ther. 11 P. M.	Barometer. Sun-rise	Barometer. Mid-day	Barometer. 11 P.M	Winds. Morn-ing.	Force	Winds. After-noon	Force	Winds. Even-ing.	Force	Clouds. Course of clouds	Clouds.	Rain	Observations.
1	28	46	35	29.65	29.61	29.59	SW	1	S	1	W	2	W	W	.20	Clear—shower at night.
2	32	42	30	.55	.54	.60	NW	3	NW	2	N	1	NW			Partly clear—sn. showers.
3	24	39	29	30.08	30.08	30.12	NW	3	NW	3	N	1				Clear.
4	25	45	33	.12	.04	.02	W	1	SW	2	S	1				Clear.
5	32	53	46	.00	29.95	29.88	SSW	1	SW	1	SW	1	SW	SW	.20	Clear, cloudy, rain.
6	45	61	48	29.82	.85	30.03	SW	1	NW	3	N	1	SSW	NW		Cloudy—clear.
7	41	55	43	30.19	30.10	.08	SE	2	SE	2	E	1	WSW	NW	.20	Mostly clear.
8	47	67	40	29.84	29.68	29.95	S	3	W	4	NW	3	W	N		Cloudy—rain & lightning
9	36	46	32	30.22	30.24	30.44	NW	3	NW	3	N	1	W			Mostly clear.
10	27	40	32	.50	.32	.12	NE	0	S	1	S	1	W			Clear—cloudy.
11	36	46	40	.10	29.99	29.84	SE	1	S	0	W	0	W	W	.08	Cloudy—rain.
12	44	60	40	29.81	.70	.85	WSW	3	NW	4	NW	3	W	W		Cloudy—clear.
13	34	47	35	30.00	30.04	30.10	NNW	2	NNW	3	NE	1				Clear.
14	33	52	38	.05	29.90	29.75	E	2	SE	2	E	2	W			Cloudy—rain
15	33	46	39	29.72	.76	.87	NNE	2	N	2	NW	1	NE	NW	.60	Cloudy—rain.
16	37	51	33	30.00	30.02	30.06	E	2	S	1	SE	1	NW	NW	.03	Mostly clear.
17	34	55	40	.05	.03	.06	NW	1	SE	1	NE	1	E	SE		Mostly clear.
18	37	56	47	.11	.12	.10	E	2	S	2	SE	2	SE	SE		Foggy—clear.
19	45	72	55	.00	29.84	29.84	SW	3	SW	3	SW	0	W	SW	.20	Partly clear.
20	57	74	64	29.83	.75	.64	SW	3	SW	3	NW	5	SW	NW		Partly clear—th. g. in eve.
21	40	42	30	.71	.80	.97	NW	3	NW	4	NW	3	NW	NW		Partly clear.
22	20	34	26	.94	.93	.93	NW	4	NW	4	W	1	W	W		Clear.
23	30	45	39	.97	.90	.80	NE	2	S	2	NE	1	W	W		Mostly cloudy.
24	40	55	38	.75	.70	.84	NE	2	NW	2	N	2	WSW	WSW	1.05	Partly clear.
25	35	44	41	.80	.59	.70	NE	2	E	2	NW	3	SE	NNW		Cloudy—hail and rain.
26	34	44	34	.95	.97	30.00	NNW	2	NNW	2	NNW	1	W	W		Cloudy—clear.
27	30	53	37	30.14	30.12	.14	NE	1	SW	2	S	1	W	W		Clear.
28	34	60	47	.09	.03	29.91	NE	1	SSE	2	SSE	0	S	SW		Mostly clear.
29	45	65	35	29.80	29.70	.85	SSW	2	SW	2	NNW	3	SW	NNW		Cloudy—clear.
30	28	40	30	30.00	30.03	30.08	N	3	NW	3	NE	2	NW	NW		Clear.
31	26	52	37	.17	.10	29.95	NE	1	SSE	2	SSE	2	NW	SW	.60	Clear—cloudy—rain.

☞ The foregoing observations on the thermometer, barometer, and winds, are taken three times a day; at sunrise, mid-day and 11 P. M. In the column representing the force of the wind, 0 denotes calm or nearly so, 1 a light breeze, 2 a breeze, 3 a wind, 4 a high wind, and 5 a very high wind. The two additional columns denote the direction in which the clouds were observed to move; the former column referring to the upper stratum of clouds, and the latter to the lower, when two different strata were visible.

* These tables were received for the first number of the Advocate, being a continuation of the Weather Journal of the present year; but we were obliged to defer their publication, owing to the quantity of matter on hand, at that time. The journal for January and February were published in the old series of our paper. We will continue thus to give our readers observations for two months in each number, till we *catch up with time.*

SUMMARY.

Average at sunrise, thermom.	35°13	—barom.	29.966	inch.
Do. mid-day, do.	51°19	do.	29.917	do.
Do. 11 P. M. do.	38°48	do.	29.940	do.
Monthly average, do.	43°16	do.	29.940	do.
Maximum (30th) do.	74°	do. (10th)	20.50	do.
Minimum (22nd) do.	20°	do. (2nd)	29.54	do.
Range do.	54°	do.	96	do.
Warmest day (20th) do.	65½			
Coldest day (22nd)	27			

Proportion of clear weather, ...	19 days
Do. cloudy do.	12 "
Whole days clear do.	10 "
Days on which rain fell	9 "
Quantity of rain	3.16 inches.
Northerly winds prevailed (proportion) .	12 days
Easterly do. do. do.	8 "
Southerly (S. to W.) do.	11 "

Observations.—No auroras. Clouds electrified on two days. A thunder gust on the 20th, followed by very cold weather. Three easterly storms, one very slight, and attended with but little rain; the other two transient, but accompanied with considerable rain. Rains frequent but moderate. No snow of consequence; a pretty deep snow fell at New York on the 15th. Winds changeable, and frequently high. Temperature seasonable, and in character with March, being very variable. A very sudden change followed the thunder gust on the 20th. That day was the *warmest* in the month, the thermometer being at 74° at noon; and the day but one following was the *coldest*, being 40° colder at noon than the 20th. The blossoms of the peach which were partly expanded in favorable situations, were much injured by this and the subsequent cold.

JOURNAL OF THE WEATHER FOR APRIL, 1834.

Days	mo.	Ther. Sunrise	Ther. Mid-day	Ther. 11 P. M.	Barometer. Sun-rise	Barometer. Mid-day	Barometer. 11 P. M.	Winds. Morning	Force	Winds. After-noon	Force	Winds. Even-ing	Force	Clouds. Course of clouds	Clouds. Rain	Observations.
1	43	56	47	29.80	29.75	29.75	SSW	2	SSW	2	SW	1	W	.50	Rain—cloudy
2	50	52	47	.82	.85	.92	SW	2	NNW	1	N	1	WSW	.08	Cloudy—rain—clear
3	38	57	39	30.16	30.18	30.22	NNE	1	NE	1	SE	1	WSW		Cloudy—clear
4	37	48	37	.26	.30	.37	NE	2	ENE	2	NE	2	WSW		Cloudy
5	35	48	39	.37	.37	.26	NE	4	ENE	3	ENE	2	NE		Clear
6	40	47	41	.17	.12	.07	NE	4	ENE	4	ENE	4	ENE	.30	Cloudy—rain
7	43	51	52	.01	.01	29.97	NE	4	ENE	3	ENE	1	ENE	3.50	Heavy rain—cloudy
8	53	64	52	29.99	29.87	.84	E	1	SW	1	E	1	E	.20	Cloudy—rain—clear
9	52	62	50	.84	.84	.84	E	1	E	2	ESE	2	SW	.10	Cloudy—rain
10	42	42	42	.99	.99	30.05	ENE	3	ENE	3	NE	3	?	.05	Cloudy—rain—some snow
11	37	58	42	30.07	30.13	.14	NE	2	E	2	WNW	0	WNW		Clear
12	39	67	46	.13	.10	.06	NW	0	E	0	W	0	W		Clear
13	42	73	54	.04	29.99	29.90	SW	0	SSW	0	W	0	W		Clear
14	51	77	53	29.87	.87	.80	E	2	E	2	W	1	W		Clear—hazy
15	51	77	55	.77	.72	.65	SW	1	SSW	1	W	0	W		Clear—hazy
16	52	77	56	.58	.57	.55	SW	0	SW	1	W	1	W		Clear—hazy
17	53	83	58	.55	.53	.70	W	1	NW	2	N	2	NW		Mostly clear—hazy
18	46	64	48	.95	.95	.93	NE	2	F	2	SE	2	W		Clear—hazy
19	44	55	51	.90	.80	.80	E	2	SE	2	SE	1	SW	.40	Cloudy, rain, light'g in n.w.
20	48	71	55	.78	.75	.72	NW	2	NW	1	NNW	0	NNW		Clear
21	53	79	60	.73	.73	.73	E	2	S	2	SE	1	?		Mostly clear—hazy
22	58	73	45	.75	.79	.72	E	3	E	3	E	3	W		Clear—cloudy—some rain
23	47	58	58	.68	.67	.60	NW	3	SW	2	NW	4	SW	.02	Cloudy—rain—light'g in e.
24	53	62	48	.65	.69	.69	NW	4	NW	3	W	2	W		Clear
25	40	35	34	.70	.68	.67	NE	2	NE	2	NW	0	SW	.05	Cloudy—rain and snow
26	32	53	33	.65	.64	.50	SW	2	SSW	2	NW	0	SW	.30	P. clr.—rn.—light'g—snow
27	29	45	38	.50	.49	.48	NW	2	W	4	S	3	NW		Clear—cloudy—some snow
28	36	62	48	.49	.47	.47	W	4	NW	3	NW	4	NW		Clear—cloudy
29	47	63	47	.47	.43	.47	E	3	N	2	N	0	W	.04	Clo.-cl.-th.g. in n.-shower
30	42	64	54	.40	.40	.41	N	2	N	2	N	2	W		Clear—cloudy

SUMMARY.

Average at sunrise, thermom.	44°43	—barom.	29.832	inch.
Do. mid-day, do.	61°10	do.	29.756	do.
Do. 11 P. M. do.	47°63	do.	29.842	do.
Monthly average, do.	52°765	do.	29.81	do.
Maximum (17th) do.	83°	do. (4th)	30.37	do.
Minimum (27th) do.	29°	do.(30th)	29.40	do.
Range, do.	54°	do.	.97	do.
Warmest day (17th) do.	68°			
Coldest day (27th) do.	37°			

Proportion of clear weather, ...	17 days.
Do. cloudy do.	13 "
Whole days clear, ...	9 "
Days on which rain fell, ...	12 "
Northerly winds prevailed, (proportion,)	9 "
Easterly do. do. do. . .	12 "
Southerly, do. do. (S. to W.)	9 "
Days on which snow fell, ...	2 "
Quantity of snow, ...	½ inch.
Quantity of rain, ...	5.54 inches.

Observations.—No auroras were observed; one was said to have been seen from Philadelphia on the 5th. Clouds electrified on four days. Five easterly storms, three of which were attended with but little rain. One of the latter was accompanied with some snow, and one of the two rainy storms was of very long continuance. Rains very frequent, but moderate, with one exception, when the large quantity of three and a half inches fell in less than twenty-four hours, viz: on the 7th. A little snow fell on several days, and on the evening of the 26th there was quite a snow storm. On the morning of that day there was a heavy frost, with ice in some situations. Light showers of rain, with some hail and snow, occurred in the forenoon, alternated with pleasant sunshine. In the evening there were vivid flashes of lightning from a cloud near the zenith, almost at the same time with snow. About twelve o'clock the snow fell very fast, and continued falling till one. Next morning the sun rose on a winter landscape. The winds during the month were not very changeable, and inclined to settle in the north and east. There were frequent high winds. The temperature was variable, being a medley of spring, summer and winter. About the middle of the month it was very warm; on the 17th, the thermometer rose to the extraordinary height of 83 degrees. The 25th was 50 degrees colder, and snow fell slowly through the greater part of the day. The morning of the 27th was the coldest morning in the month, the mercury being three degrees below the freezing point. A great deal of fruit was destroyed by this weather.

The following table exhibits the progress of vegetation in this and the preceding month.

March 3*rd.*—*Alnus serrulata*, (candle alder) and *Acer rubrum*, (common maple) begin to flower.

19*th.*—*Sanguinaria Canadensis*, (blood root) *Hepatica triloba*, (liver wort,) and *Anemone thalictroides*, in bloom.

21*st.*—A few peach blossoms out.

27*th.*—*Erythronium Americanum*, (dog-tooth lily.)

April 4*th.*—Vegetation advances very slowly. Maple and alder blossoms mostly killed by the late frosts.

12*th.*—Vegetation starts rapidly.

13*th.*—Peach in full bloom.

14*th.*—Plum and cherry do.

20*th.*—Apple in bloom.

21*st.*—*Cercis Canadensis*, (red bud, or Judas tree,) in bloom.

SOME ACCOUNT OF THE CICADA SEPTENDECIM, OR PERIODICAL LOCUST.

By Henry Gibbons, M. D., of Wilmington, Del.

(Continued from p. 45.)

In the former part of this essay, I traced the history of the periodical locust from the moment of its arrival to the surface of the soil in the pupa state, until the females are prepared to deposit their eggs. The ovipositor, with which they puncture the trees for that purpose, is about half an inch in length, and lies appressed to the lower part of the abdomen when not in use. Its form and dimensions are represented in the annexed figure.

The ovipositor, or sting, as it is commonly called, has a deep groove on the side next the abdomen, which answers the pur-

pose of a tube for conducting the eggs into the nidus prepared for them. In the smaller figure are observed two small bodies projecting from the abdomen, one on each side of the ovipositor. When the insect is at rest, they lie close upon the sting, so as not to be easily observed. These blades are hard in their structure, like the ovipositor itself. One might suppose their object to be to assist in penetrating the substance of the branch which has been chosen as a receptacle for the eggs. But I have not been able to detect the animal employing them for this purpose. They appear designed to aid in the transmission of the eggs along the ovipositor; for I have seen them employed only by rubbing them along the ovipositor while the insect is engaged in the task of depositing her eggs.

In ten or twelve days from their appearance above ground, the females are ready to lay. To accomplish this object, they select a twig, mostly of the growth of the past year, and clinging to the lower side with their head looking toward the end of the branch, they first open the bark longitudinally by several successive efforts with the ovipositor, at the same time separating it from the wood for a little space on each side of the incision. The instrument is then gradually forced into the wood in an oblique direction till it pierces the pith, and this operation being frequently repeated, a portion of the wood is at length reduced to splinters, and the eggs are inserted in two parallel rows. Each nidus thus completed, contains from thirty to forty eggs, and occupies a space about one-fourth of an inch long. The insect now advances a short distance so as not to interfere with the result of her previous labors, and forms a second deposit precisely in the same manner. A single locust will make twenty or more of these distinct nests, either in a regular series occupying several inches of the twig, or in several detached parcels. The number of eggs deposited by one locust is, therefore, not less than four or five hundred. Their form is oblong like a grain of rye or wheat; but they are not one fourth as large as either of those grains.

In selecting trees for the purpose of laying, they manifest a preference for the various species of oak, and also for apple

and pear trees. I have not observed them to make use of the Lombardy or Athenian poplars, nor of any of the willows. Cedars, pines, and other resinous trees, they are careful to avoid, either because of the toughness of their bark or wood, or on account of the resinous quality of their juices.

The injury inflicted on the tree by the locust is mostly sufficient to kill the twig, which sooner or later breaks off and falls to the ground. Only a few of the limbs, however, are broken from the tree before the eggs are hatched. In what manner the young insects reach the ground when they are not carried there by the fall of the branch, I am not able to determine. They must either crawl down the trunk of the tree, or suffer themselves to drop from the branches. I think it most probable that they adopt the latter mode.

The wound made by the locust in the twig is much deeper than would suffice merely to contain the eggs. Were it not, the incision would heal over, and destroy the progeny. Even as it is, this sometimes happens where the tree is young and very thrifty. Hence we observe the necessity that the locust should pierce, or rather lacerate, the branch to its centre. There appears to be an important design contemplated in the infliction of a wound fatal to the branch, while at the same time enough of the wood is left uninjured to support it until the eggs have hatched. For the eggs in this way derive the full benefit of the solar heat, which they might not enjoy were the limb containing them to be detached from the tree.

In no other way are the locusts destructive to vegetation than by the injury which they inflict on the small branches of trees, in the manner described. As a general observation, this injury is unimportant. Occasionally, however, a young or a small tree suffers considerably; and we may observe here and there on the skirts of a wood, a month or two after their visitation, a white oak, with the extremities of nearly every branch completely dead, and ready to fall with the winds of autumn. I have seen trees of considerable size deprived of more than a year's growth by the operations of the female locusts.

Having thus provided for a continuance of their race, the

whole of the parent generation die. Great numbers may be seen strewed over the ground in the woods, some dead, others nearly so. I have remarked that in a large proportion of the males the posterior rings of the abdomen, and often the entire abdomen, drop off; and the insect frequently flies about with nothing but its head and chest. They appear to suffer no pain in consequence of this mutilation, being lively in their movements, and continuing to utter their peculiar note. Their flight, however, is unsteady, when they are in this condition, owing to the absence of the means by which they are accustomed to balance and guide themselves.

Whether the locust emerges from the egg and enters the ground in a larva or pupa state, has been a subject of difference of opinion. Writers have generally adopted the belief that the early part of its life is passed in the larva form, and that it undergoes a transformation into the chrysalis while buried in the soil. This opinion is controverted in the account given by Dr. W. Gibbons, to which I referred at the head of this essay. It is stated by him that the insects undergo no change, except an increase of size, until they rise from the earth seventeen years after their descent. An anonymous correspondent of a Baltimore paper,* has recently confirmed this statement. By examining the insects when just emerged from the egg, he found them to be very nearly identical in form with the full grown chrysales.

My own observation of them after their entrance into the earth, has since removed from my mind every doubt on the subject. It is difficult to find them above ground when just hatched; for they seem to vanish at the moment of leaving the egg—a circumstance which has probably given rise to the ridiculous notion that they get to the ground by crawling down the tree between the wood and bark. Although I collected some of the branches containing the eggs, and placed them under a glass, I even failed in detecting the young locusts in this way; either they escaped from the glass, or the eggs did not hatch. On the 12th of the ninth month, about five or six

* Vide Niles' Register of August 16, 1834, into which the article is copied from the "Methodist Protestant."

weeks after the trees had been deserted by them, I selected a young oak that was covered with dead twigs, and dug into the soil beneath it in search of the enterprising miners. I first discovered a number of insects which proved to be the young of a species of ant, and which might very easily be mistaken for the locusts. But after a closer inspection, I had the good fortune to find the locusts themselves, about two or three inches from the surface. They were much smaller than the ants, and each one was isolated from the rest of his tribe. On viewing them through a magnifier, I saw distinctly the large double claw, the antennæ, the proboscis, and every other characteristic of the full grown insect, except the wing-cases, which were invisible. The antennæ or feelers appeared to me longer in proportion than in the mature chrysalis, and the body was also somewhat longer in proportion to its size. Its whole length was about that of the little red ant, so notorious to housewives. Its color was a dirty or yellowish white, excepting the claws and feet, which were brown, and the eyes, which were minute black spots. Every part of the body and limbs appeared covered with small bristles. It was quite active in its movements, and while lying on a piece of paper, endeavored diligently to dig into it with its claws. When placed on a quantity of earth, it buried itself in a few moments.

The source from which the locust derives its nourishment while under ground is a problem in natural history, not to be easily solved. One can hardly imagine them to feed by means of their suctorious tube, as this does not appear adapted to the situation of the insect. The idea has occured to me that they may absorb their nutriment by the surface of the body. Bichat, the celebrated French anatomist, asserts that birds of several kinds are fattened in a few hours by a fog, owing to some peculiar influence of the moisture on their surface. It may not be deemed impossible that the moisture of the earth exerts an analogous action on the locust.

In what manner the locusts spend the seventeen years of their subterranean pilgrimage, we cannot say. All that is positively known of their movements is, that they sometimes descend to a great depth, and that they emerge from the earth

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The source from which the locust derives its nourishment while under ground is a problem in natural history, not to be easily solved. One can hardly imagine them to feed by means of their suctorious tube, as this does not appear adapted to the situation of the insect. The idea has occured to me that they may absorb their nutriment by the surface of the body. Bichat, the celebrated French anatomist, asserts that birds of several kinds are fattened in a few hours by a fog, owing to some peculiar influence of the moisture on their surface. It may not be deemed impossible that the moisture of the earth exerts an analogous action on the locust.

In what manner the locusts spend the seventeen years of their subterranean pilgrimage, we cannot say. All that is positively known of their movements is, that they sometimes descend to a great depth, and that they emerge from the earth

very near the spot where they entered, having journeyed in a direction perpendicular or nearly so. Some of their historians pretend to judge of the depth of their descent by tracing the holes from which they rise. If such persons would ask themselves how the animals dispose of the soil which they remove in making the excavations, the reflection might enable them to detect the fallacy of their inferences; for it is evident, that unless the insects annihilate the earth by devouring it, the holes which they have formed will be found partly or entirely filled.

The depth to which they penetrate is doubtless influenced by the nature of the soil. In some places where the substratum is a solid rock, they cannot possibly enter more than a few feet. On the other hand, satisfactory proofs are not wanting, that they have been found in digging wells twenty feet from the surface, and that they have come up in cellars of houses that were built subsequently to their descent.

It has always been the general belief that the locust is incapable of inflicting any injury upon other animals. But some statements have lately appeared in the public prints, alleging that children have in several instances suffered severely, and even mortally, from their sting or bite. Such statements should be received with caution and distrust. The only means by which the insect can possibly accomplish the alleged mischief, are the proboscis, and in the female, the ovipositor. These parts we know are neither designed nor commonly used as weapons of offence or defence; and we are therefore at liberty to infer, from the analogy of nature, that they are never thus employed. I have handled the animal with impunity, and several times carried them in my hat upon my head. Among hundreds of similar instances that I could cite, I will select that of my sister, a child three years old. This little girl was particularly interested by the locusts, and spent most of her time in catching and playing with them. For a week or two during their stay, she was seldom to be seen without a locust in each hand; and she would frequently go into the garden with her brother's hat, and after catching a number of them and placing them in it, she would put on the hat and walk about, amused with the sensation produced by their crawling over her head.

If there is any truth in the reports of persons having been injured by locusts, the injury may have been inflicted by the female while under the influence of the instinctive impulse to form a nidus for her eggs. With a view to test the strength of this impulse, I caught two or three of the females while in the act of piercing the trees, and placed them under a large glass jar, together with the limbs which they had attacked. But instead of continuing their work, they crawled about for some time in a discontented mood, and ultimately died without evincing the least disposition again to use their ovipositor.

The common name and peculiar habits of this insect have made it the subject of many absurd notions. One of these notions supposes the insect to spend the seventeen years of its absence from our sight in undergoing a variety of transmutations into butterfly, a caterpillar, and so on. Equally ingenious is the supposition that the long term of absence is spent in a subterranean journey from Egypt. Associated by name with a scourge of the east, the fancy of the ignorant has detected the initial of war inscribed on its wing, and the sound of the word Pharaoh mingled with its note of love.*

Naturalists have observed that in the year of the visitation of the periodic locust, and also in the year following. Some other tribes of insects are often unusually abundant. In the present summer this was remarkable with respect to the tent caterpillar, which ravaged the forests in certain parts of Delaware, Maryland and Pennsylvania, and perhaps more extensively.

Young orchards and nurseries of fruit trees are liable to suffer considerably from the depredations of the locust on the tender twigs. The proper method of preventing this is to kill the locusts or drive them from the trees. It is only during the heat of the day, and particularly in the forenoon, that the insects

*Ignorance is occasionally promoted by attempting to enlighten the ignorant. Editors of newspapers often commit this error by promulgating erroneous impressions and incorrect statements. A New York paper, in particular, when the locusts first made their appearance in 1834, gave a full history of the Egyptian locust, at the same time premising that the editor did not know whether it was the same with our insect or not; but as they were both *locusts*, every body ought to know all about the Egyptian locust!

are at work; and it is an easy matter to walk among the trees at this time and knock them down with a stick. In the summer of 1817, when I was a small boy, it was made my business in this way to protect a nursery of young apple trees. I walked backward and forward along the rows with a narrow strip of shingle in my hand, with which I brought down all the locusts within my reach. Having collected them in a bucket as I progressed, I counted them in order to compute the profits of my work, and then threw them to the pigs, who were delighted with the feast.

The locusts form a favorite article of food to a great variety of animals. Hogs consider them a luxury, and they are greedily devoured by squirrels, poultry, and birds of all kinds. Dogs are known frequently to eat them, and I know of a cat who spent part of her time daily in catching them. They may often be found lying in great numbers on the ground under a tree, with their heads eaten off, probably by birds, and the bodies are soon devoured by ants. I have seen the ants attack them while in the act of escaping from the shell, and kill them before they could disengage themselves. One evening, just before sundown, I had been riding in the country, and stopt under a large oak where thousands of the chrysales were coming out of the ground to throw off their shells; and being curious to know what my horse thought of the insects, I held a handful to his mouth, and was surprised to see that he devoured them eagerly. I frequently afterwards treated him to a mouthful, both in the chrysalis and in the winged state. Some tribes of American Indians are said to fry them for food, and regard them as a great delicacy. A friend of mine fried a quantity of them which he collected before they had broken their shells, and ventured to taste the mess; but he found them too oily to be agreeable. Advantage has been taken of the great quantity of oil they contain, to apply them to the manufacture of soap, which has been done in some parts of New Jersey. I have no doubt they might be advantageously employed for this as well as for other purposes.

WHITING'S MENAGERIE.

THE menagerie which was exhibited in this town last week, made a fine show, and drew a concourse of people from the neighboring towns. About 2,300 persons were admitted to the tent. The lion was a fine looking animal, taken from the forest within a year. His keeper seems to be one of the few men in whose favor the ordinary habits and laws of animal ferocity are suspended. His name is Whiting, and he is a native of Plainfield, in Hampshire county. When he first saw this lion, it had never shown any symptoms of docility. Eleven days after, he entered his cage, and was cordially received. During his subsequent absence, another person after spending a considerable time in forming an acquaintance with the lion, ventured into his cage, was immediately seized, and rescued with great difficulty. When Mr. Whiting returned, the lion recognized him with the greatest joy, and returned at once to its acquired habit of obedience. When the celebrated Dr. Willis, (the physician who attended George III. in his fits of insanity,) was asked how he controlled his raving patients,—"In this way, sir," said he, fixing his eye on the person who put the question. It was a sufficient answer. Mr. Whiting uses the same organ of expression. His eye while in the cage never wanders from that of the lion, and the expression is then decidedly the most savage of the two.

The elephant was two or three hours in getting over the Connecticut, the evening after he was exhibited here. As soon as he got into the middle of the stream, (very deep and rapid at the place where he crossed,) he began to play about in the water, and gambol in the most antic manner; and when his keeper undertook to punish him, he immediately sunk ten or fifteen feet, leaving them to swim for their lives. A dog who is domesticated with him, was then sent to seize him by the ear, and lead him out; the elephant wound his trunk round his body, and tossed him twenty feet in the air. All this was done good humoredly, and with no intention of serious mischief. When tired, he came out and surrendered himself.—*Greenfield paper.*

OYSTER LAMP.

M. de Lavage remarked, on opening an oyster, a shining bluish light, resembling a star near the centre of the shell, which, on nearer examination, he discovered to be phosphorus. On scooping it out of the shell, it extended nearly half an inch in length, and when immersed in water, seemed in every respect the same as artificially prepared phosphorus. The oyster in which this was discovered was perfectly alive and fresh. The light could not, therefore, proceed from any decomposition of the shell or the animal, but must have been derived from some other source. Upon examining this phosphorescent substance by the aid of a microscope of considerable power, it was found to consist of various animalculæ, each beautifully luminous, like miniature glow-worms, lighting up their starry lamps to illuminate the dark solitary chamber of the shell, and intended, perhaps, like the enchanted lamp of Armida, to lure within its reach such marine inhabitants as it might prey upon.

DIRECTIONS FOR THE GATHERING AND PRESERVATION OF PLANTS FOR HERBARIA.

Two very good essays have been lately written upon this subject. One by Dr. C. W. Short, of the Transylvania University, and published in the Journal of that Institution, and the other by J. L. Reddell, A. M., published in the Western Journal of Medical Sciences. We proceed to extract from both such portions as will prove most useful to the botanical student:

"As no one individual, at any season of the year, however favorably situated, can immediately refer to a large number of living plants at once; much less can he have them growing before him, at all seasons of the year. This difficulty is then most conveniently remedied by forming a collection of dried specimens, which, if well selected and preserved, and conveniently arranged, offers to our study and examination, at any moment, all the plants of a whole district, or even of the world.

To this may be added, as the testimony of a very competent witness, and indeed, as the result of universal experience, that 'no one can be a botanist without collecting plants, and making up a herbarium with his own hands.'

"The manual labor of a botanist in forming his collections, may be arranged under three heads, as there are three several stages in the process: these are,

"1. The collection of plants in their living state.

"2. The drying of them for preservation.

"3. The arrangement of the dried specimens in some suitable manner for convenient reference."—*Mr. Short.*

To which may be added, from Mr. Reddell:

"4. Magnifying glasses, for aiding in the analysis of plants, by rendering the organs in minute flowers more obvious and easy to be examined.

"5. Pencil and paper for labelling.

"6. When on any considerable excursion, one should be provided with a note book, pen and ink, or pencil."

"1. Before commencing your herborizing excursions, you must provide yourself with a tincase, technically called a *vasculum*; a small trowel, or a strong knife. The vasculum is very similar to a common tin candle-box; it should not be less than eighteen inches long and six inches in diameter, having a narrow lid opening on the top nearly its whole length, and secured by a hasp or catch. If this box is somewhat flattened on two sides, so as to assume rather an oval than a perfectly circular form, it will be more conveniently carried under the arm; and for this purpose it should be provided with two loops for a strap, by which it is suspended from the shoulder.

"The peculiar excellence of this apparatus is, that plants shut up in it are effectually protected from evaporation, or injury of any kind; for collections made in the morning are taken out at night in a state of perfect freshness; and they will even continue so for several days. The protecting influence of this case is still the greater if it be not painted or japanned; as the sun, being more perfectly reflected from the bright surface of the tin, will be less injurious to the plants contained within it. Some prefer taking with them on these excursions

an oiled bag of silk; and some a large book of bibulous paper; but the tin vasculum is decidedly preferable to either. The use of the trowel, or the knife, is that of taking up small plants by the roots, or cutting larger ones into convenient lengths.

"Thus equipped you start upon an herborization: and here the young botanist is apt to commit his first error; for, supposing that the common and unsightly productions of his neigborhood,—those which he has been accustomed to consider as mere *weeds*,—are of no interest whatever, he passes over all such, in search of those which are more rare, more imposing in appearance, or more beautiful in flower. This is a radical error which you must avoid, and it should be your aim to collect every thing growing in your reach, and especially all such as are natives of the country; for when you come to exchanging specimens with distant botanists you will find that they take more interest in your common weeds, than in some others which you deemed more worthy of preservation. Collect then every thing which you meet with.

"Another difficulty to the beginner arises from the great diversity in the size and habits of the plants, from the diminutive moss to the giant oak. As a general rule in this matter, the smaller are to be collected whole; the larger ones must, of necessity be divided. As the length of your box has been directed in reference to the size of the paper in which your specimens are to be preserved and arranged, all plants which you can get into it without doubling or bending, should be gathered entire, even with their roots; those too large for this may be cut into two, or even three pieces of the proper length; which, in general, is preferable to bending or doubling them. Of those which are still larger it will usually be sufficient to gather a specimen from the summit, or part bearing the flower, together with a few leaves growing on different parts of the stem, and those of the root; for often the leaves on different parts of the same plant, are different in shape, or modes of attachment to the stem, from each other, and these differences should always be shown in the specimens preserved. Of trees, and the most of shrubs, you must of necessity content yourself by gathering the smaller twigs alone

selecting such, however, as bear the most perfect leaves and flowers.

"As a general rule all plants should be gathered when their flowers are most perfectly developed; and it is always desirable when the flowers appear before the leaves are unfolded, as in the most of our forest trees, that specimens be gathered, both when in flower and in full grown leaf: and moreover, when the fruit is of a kind which can be preserved in the manner presently described, that specimens of the fruit should accompany those of the flower and leaf. Some flowers are so exceedingly fugacious as to shed their petals within a few hours after unfolding, as the common *Sanguinaria*, *Jeffersonia*, and *Hydrastis;* these and some others, although they be put into your vasculum with full blown blossoms, will probably be found on taking them out, to have dropped them. This is best remedied by gathering specimens of such individuals as are not quite fully expanded, and if they should not have opened by the time you are prepared to preserve them, a few hours standing in a vase of water will bring them to the proper point.

"Some very extensive tribes of vegetables are so very similar in their flowers, and other parts upon which distinctions are usually founded, that it is only by referring to their fruit, or ripe seeds, that they can be satisfactorily determined. Such are the large family of *Umbelliferous* plants, and the extensive grass-like genus *Carex*, not to mention some other tribes with which you will hereafter become better acquainted. These, therefore, should be gathered when their seeds are fully grown, but before they become so ripe as to shatter off too easily. Yet even of these I would advise that specimens be gathered also in the flower, for then their leaves are generally most perfect. In selecting specimens of all plants for preservation, you should take such as are fair samples of the most common height, habit and appearance of the species; rejecting stinted dwarfs on the one hand, or luxuriant monsters on the other: at the same time if any peculiar circumstance is found to characterise particular individuals of the species, constituting what are called *varieties*, specimens indicating these variations should be collected.

"II. The drying of them for preservation. This is done by subjecting them to pressure between folds of dry paper. For this purpose you must be provided with two or three reams of unsized printing paper, and some sort of machinery for making considerable pressure. It is well to be provided, moreover, with several loose boards of different thicknesses, but of uniform size with the paper employed: and the best size for the paper is that called by printers *medium*, which should be of a good, thick and substantial body. Divide one of your reams into parcels of four or five sheets, and prevent these sheets from becoming detached by passing a few stiches through them. These parcels, thus being eight or ten double, are called *dryers;* and they may be more economically made, and answer the purpose equally well if made of old newspapers, or other kind of waste paper, provided it be smooth and bibulous. If such are used they should be trimmed to the medium size, and stitched together by means of a thread running around the entire margin. The number of these dryers required will of course be in proportion to the number of plants which you undertake to preserve. In the extensive collections which I have made during the past season, I have found not less than one hundred sufficient; but when once prepared they will answer for several seasons' constant use. Unsized paper is preferred, because it absorbs moisture from the plants, much more readily than that which has been sized.

"With these fixtures you are prepared for the task before you, which consists in placing your plants in single sheets of paper, putting these sheets between alternate dryers, and subjecting the whole to pressure. This is the nicest part of the entire process, and as upon the mode in which it is done, the value and usefulness of your collection will depend, particular instructions will be given on this head. Take then any one plant from the vasculum and lay it between the leaves of a single sheet of your paper, taking care to spread it out so as to have its parts as little confused as possible. In doing this, however, you must give to its parts no unnatural direction; for instance, do not give to a flower which naturally droops an erect position; flower stalks which are attached

to but one side, must not be turned to both: a crooked or a tortuous stem must be left so, and a strait one must not be bent: in short avoid all unnatural stiffness, formality, or artificial arrangement of its several parts, and preserve as nearly as possible the natural habit of the plant while growing—for as it is now dried it must for ever afterwards remain. This sheet, with the plant or plants so arranged in it, is then placed on one of the dryers, and another dryer laid on it. Of the smaller plants a number may be placed in one sheet; of the larger several sheets may be required by the different parts of the same plant; but care must be particularly taken in arranging them, that the different plants thus placed in the same sheet do not overlap or overlay each other, lest under pressure they should adhere together and otherwise interfere with the drying. Of such plants as have their stems very thickly set with leaves, some of these may be removed, so as to preserve and exhibit the remainder more perfectly. Where a number of stems arise from one point, and thus interfere with the equable pressure of the specimen, some from the under and upper sides may be removed."—*Short.*

"If roots are too thick to find a place in a herbal, they may be pared down, or thin sections of them may be saved. It is better to preserve such roots by washing them carefully in the first place, and allowing them to dry in the open air, attaching a name or number to them by means of a needle, strong thread or twine, and a piece of card.

"Thick succulent fruits, as the papaw and persimon, are best preserved in spirits of wine; but it is most always advisable to place transverse and longitudinal sections of them in the port-folio. It is certainly very well to accompany the twigs, leaves, and flowers of forest trees and shrubs, with neat sections of the wood and bark. The bark of the trunk may be obtained with a knife, and the section should be a vertical one, and towards the centre of the tree. The wood is most conveniently procured from a branch of moderate size. Thin sections, too, of such capsules as are borne by the Poppy, Nigella, and the like, should be preserved.

"Dissections of flowers can be rapidly and neatly made with

a small sharp knife or lancet; and they commonly present a beautiful appearance when dry. To prevent the stamens, styles, sections of immature capsules, and other minute parts, from being lost, they should be immediately laid on a piece of fine gummed paper,* and placed in the port-folio. The pieces of paper ought generally to be one inch in width and two inches long. The dissections commonly moisten the gum by the juices they contain, and after the whole has been subjected to the drying process, remain adherent. All the organs should be thus displayed upon which generic distinctions depend, as the calyx, corolla, stamens, pistil and germ; and in compound flowers, like those of Prenanthes and Helianthus, the aigrette, chaff, receptacle and seed. Indeed, thick compound flowers, as those common to the genera Silphium, Helianthus, Rudbeckia, Dahlia, cannot be well preserved without the assistance of the knife. It is commonly necessary to sever one half of the flower by a vertical section, and then to remove a number of the disk florets with the fingers. When thus divided, the flowers are easily adjusted in the port-folio, and when dried are very beautiful and well adapted for reference, exhibiting as they do the generic characters to great advantage. Either side of the mutilated flower may correspond to the upper surface of the leaves, according to the fancy of the collector.

Before roots are placed in the port-folio they should be washed in water, and most of the superficial moisture removed by the application of spare bibulous paper. Marine plants and aquatic vegetables inhabiting stagnant pools, likewise require careful washing in clean fresh water, and a partial drying as before, ere they can be admitted into the port-folio. At this time the parts of these plants are easily arranged, and few specimens will exceed in beauty the Algæ, Ceratophylleæ and Lentibulariæ, when properly adjusted."—*Reddell.*

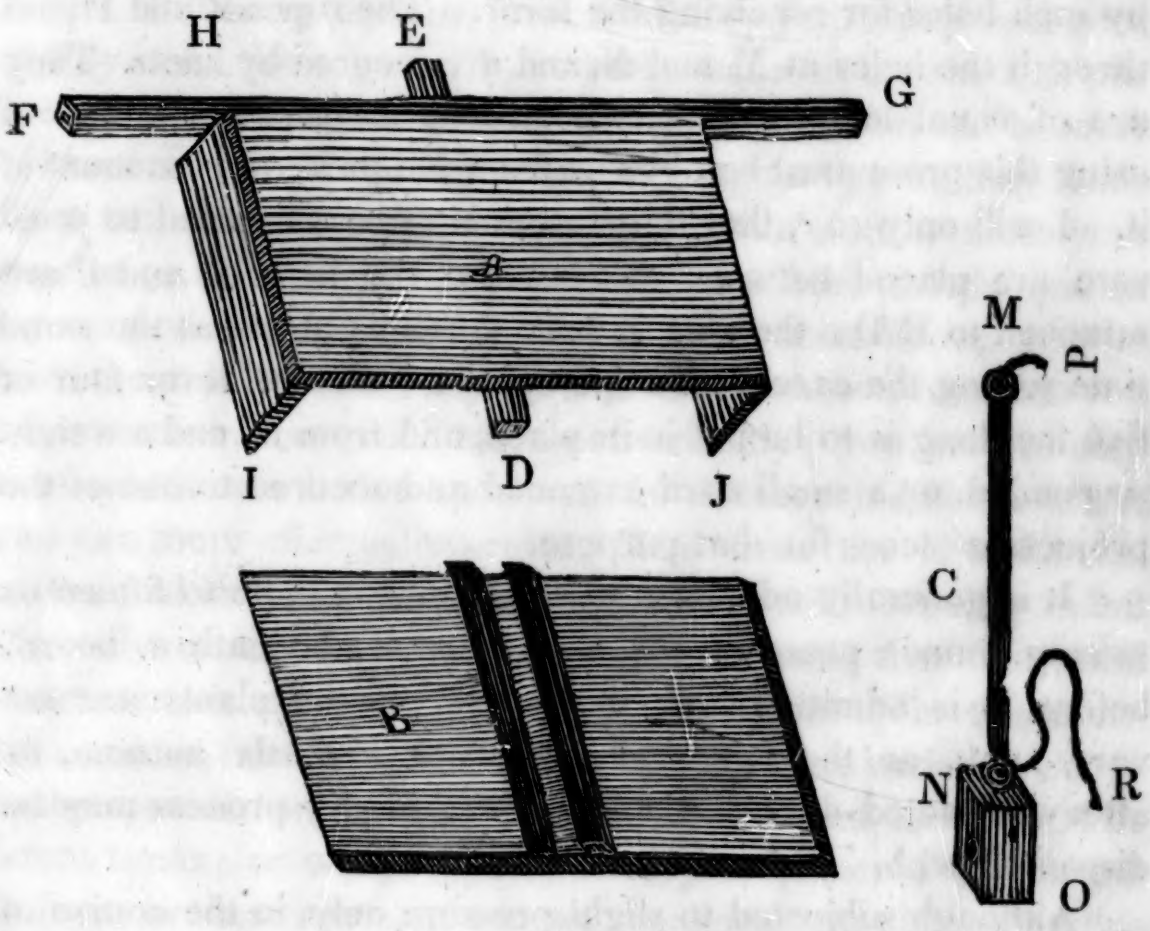
"In this manner you proceed, arranging your plants in single

* Gum is but an indifferent article for this purpose, labels being liable to peel off when they become very dry. *Mouth glue*, or what is the same thing in a more simple state, fish glue, forms a lasting adhesion of labels to specimens in the case of flowers, shells, minerals &c.; it is also good for mending broken specimens.—Ed.

sheets, and placing these between your dryers, until you have exhausted your vasculum, and formed a considerable pile. They are now ready for the press."—*Short.*

The following diagram and description of a very simple, cheap and efficacious press, is of the kind recommended by Riddell.

"A, the bottom piece, B, the top piece; C, the axle. The bottom and top pieces may be 20 inches long, by 14 wide; 18 by 12 may do. They should be made from a seasoned board



near an inch in thickness, possessing the requisite strength, and not liable to warp. The end pieces, I, H, J, are intended for maintaining the board a few inches from the floor, for the convenience of attaching or removing loops of rope. D, E, are the projecting ends of a strip of strong timber attached to the board beneath, over which the loops of rope pass. The ends of the longitudinal strip G F, are often useful in assisting to confine the lever soon to be mentioned. Transversely across the top piece and near the middle, two thin strips of board are to be strongly nailed, leaving an intervening channel or groove an

inch in width. The axle is to lie in this groove, and if that be of iron, or any stronger material than wood, the transverse strips may be approximated still nearer with advantage. The smaller part of the axle should be a trifle less in diameter than the groove above mentioned, and it should exceed in length the width of the press, by two or three inches. M and N are enlargements two inches in diameter, perforated in the same direction by holes for the reception of ropes. O is an enlargement having a diameter of four or five inches, and transversed by inch holes for receiving the lever. The ropes R and P pass through the holes at M and N, and are secured by knots. They are of equal length, and terminate in loops. The mode of using this press must be obvious from the preceding account of it. I will only say, that the materials to be subjected to pressure are placed between the boards; the loops R and P are attached to E D; the axle is brought to its place, at the same time rolling the excess of rope upon it; a stout lever four or five feet long is to be put in its place, and from its end a weight suspended, or a small cord extended and secured to one of the projecting pieces for that purpose.

"It is generally advisable to subject this bundle to fifteen or twenty pounds pressure, for a day or so, beneath a board, before it is admitted into the press. If the plants are not very juicy, as they generally are not towards autumn, or after protracted dry weather, this preliminary process may be dispensed with.

"Although subjected to slight pressure only, in the course of twelve or twenty hours the paper will become quite damp. The plants are now to be laid between dry papers, and placed in press; where, for a day or two, they may be subjected to a pressure varying from fifty to three hundred pounds. The next set of papers to which they are transferred should be, if possible, absolutely dry. The pressure may now be unlimited; and generally the plants will be preserved the more beautiful as the pressure is more considerable. The majority of plants, when thus treated, will become sufficiently dry in three or four days from the commencement of the process. Grasses, mosses, and ferns, generally require much less time for drying than

flowering plants; a single day being often sufficient to rid them entirely of moisture.

"In regard to grasses, it is generally better that they should not be subjected to severe pressure; for it is desirable that the glumes should not be deformed, and that the leaves and culms, whether keeled or channeled, terete or triangular, should still retain their characteristic appearances. We should generally be satisfied then, with pressing grasses and their allies under a weight of ten or fifteen pounds."—*Reddell.*

"III. Still using the same thick medium printing paper, of good quality, trim the edges of it, so as to have every sheet of the same size, that they may lie more neatly together, and be more conveniently handled, than with the rough edges as they come from the mill. Into these new sheets, you next transfer your specimens, from those in which they have been dried; and in my opinion it is decidedly better to leave them loose, than to have them attached in any manner to the sheet, because you can examine them much more conveniently; you may at any time substitute a better specimen for a more indifferent one; you can more effectually protect them from the injury of insects; and save the time and trouble required for fixing them. It is only necessary, for your own herbarium, that one good characteristic specimen of each species be put up in this manner; unless, in the case before specified, where varieties occur in the species; where they produce flowers and leaves at different times; or where it is necessary to preserve specimens in fruit; in these cases, of course, specimens must be preserved, showing the species in these different stages. Any duplicates which you may have pressed over and above these, may be left in their original sheets for purposes presently to be mentioned.

"This is perhaps the most convenient time for a very important, and indeed an indispensably necessary step in the business—the *labelling* of your plants. For this purpose as you proceed in shifting your specimens, take slips of writing paper of convenient size, and write upon them, first the systematic name of the individual species—then its synonyms, and next its common English name or names, if it have any. Where

any doubt exists as to the genus or species of your plant this must be expressed by the mark of interrogation (?) following after the name. To these it is always proper to add, especially if the plant be rare or peculiar to your district, various other items in relation to its history—the situation in which it is found—the character of the soil it prefers—whether marshy or dry, sandy or argillaceous, mountainous or plain &c., together with the usual height it attains—whether annual, biennial, or perennial—time of flowering, and maturing its fruit or seeds. This label should be laid in the sheet with the species to which it belongs; and a similar one should be left with any duplicates of the same which you may have on hand. If these particulars are not noted at the time, whilst they are fresh in your memory, you may forget them, and afterwards have occasion to regret the want of such knowledge.

"It must now be your care to protect this collection from two very noxious and destructive agents, *damp* and *insects*. For this purpose the case in which you keep them must be perfectly tight; and pieces of camphor, or bits of sponge moistened with some of the pungent aromatic oils, should be placed on each shelf among the volumes, and occasionally renewed. The more certainly still to prevent the depredations of insects, which will be found the more troublesome as you proceed southward, the collection should be looked over frequently in dry weather; and where their presence is detected they should be brushed away, and the affected specimen gently passed over with a camel-hair pencil dipped in a solution of corrosive sublimate in spirit. This not only protects it from farther injury in this way, but even brightens its color."—*Short.*

"I cannot concur with Dr. Short in advising beginners to marshal their plants according to the system of Linnæus; on the other hand, however limited or extensive one's collection may be, I would recommend him to arrange it according to the natural system, as improved and adopted by De Candolle and Lindley; an exposition of which, sufficient for the purpose perhaps, will be found in Eaton's Manual, (6th ed.) though I think Lindley's order of arrangement deserves the preference. In reviewing his herbarium, the student will then acquire cor-

rect notions of philosophical botany: he will learn to appreciate those indications of relationship, which will often enable him upon first sight, to assign a plant he has never before seen, its true place in the system, and to form a correct idea in regard to its hidden qualities.

"Place first, and nearest the corner, the number of the natural order; then the name of the order; next the number and name of the sub-order, or section, if such there be; below this, the genus and species, referring to authority if necessary; after which the synonyms would be in order, but they may generally be omitted, if we select the most approved systematic name. Next the common or vulgar names, and lastly the locality and date; to which may be appended any brief observations thought necessary.

"The following diagram will render the matter plain:

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LABIATÆ.

§ 5. Nepeteæ.

Galeopsis tetrahit.

Flowering nettle.

RIVER BANK, OGDENSBURG, N. Y.

July 5th, 1834." *Reddell.*

MISCELLANIA.

Dancing of the Sun.—Although we are in the habit of treating with indifference superstitious observances, yet many have their origin in natural phenomena, on which the ignorant are prone to erect some mystical doctrine. Thus it was the practice, in former times, to go out early on Easter morning to see the sun dance, which it was alleged to do as an exulting memorial of the resurrection. Although the precise origin of this custom is unknown, Foster gives an explanation which we may receive, at least, until a better one is offered. The word *east* signifies the place of rising, and is so called from its being in that quarter where the sun and stars appear to rise. East

winds prevail much about the time of year at which this feast is celebrated, and the heavenly bodies have often a wavy or dancing appearance, occasioned by the motion of the earth's atmosphere. Hence the dancing of the sun was a spectral illusion, while viewing his rising was a common emblem of the aforesaid miracle. Milton also makes use of this metaphor in a beautiful passage of Lycidas:

> "So sinks the day-star in the ocean's bed,
> And yet anon uprears his drooping head,
> And tricks his beams, and with new spangled ore,
> Flames in the forehead of the morning sky," &c.

Adulteration of Tea by the Chinese.—A French commercial paper says it has been recently discovered that the Chinese have adopted a system of mixing iron filings, or some earthy substances impregnated with iron, with the tea intended for exportation, which renders that article much heavier. A curious plan has been adopted in France, to detect this adulteration; a powerful loadstone is introduced into a case of suspected tea, and when the article has been adulterated in this way, the loadstone becomes immediately incrusted with the metallic particles.

Sunrise in the West.—The following interesting anecdote is related by Dr. Lardner, who was present at the ascent of the æronaut:

The late Mr. Saddler, the celebrated æronaut, ascended in a balloon from Dublin at two o'clock in the afternoon, and was wafted across the channel. About sunset he approached the English coast, when the balloon descended near the surface of the sea. By this time the sun was set, and the shades of evening began to close in. He threw out nearly all his ballast, and suddenly sprung upwards to a great height, and by so doing witnessed the whole phenomena of a western sunrise. He subsequently descended into Wales, and witnessed a second sunset on the same evening.

Use of alkali in pastry.—We observe the following paragraph copied into some of our American papers, from an English one, as an item of interesting information:

"At the Hatton Garden Office, on Tuesday, a pastry cook, whose shop is in Somerstown, was fined 40*s.* and costs, for having some volatile salts and other ingredients in his possession, for adulterating gingerbread. His wife told the magistrate that it was common in the trade to use such salts in making gingerbread and biscuits!"

What the "other ingredients" were, we know not; but so far as regards the "volatile salts" which are mentioned as one article employed in "adulterating" gingerbread, the writer of the paragraph has displayed a gross ignorance of the rudiments of chemistry. If the poor cook were really fined for putting ammonia into his cakes, the stupid magistrate who laid the fine ought to be deprived of his commission and sent to an infant school. Every housewife, or every tenant of a kitchen, is familiar with the use of the alkalies in the form of pearlash or soda, to render light and spongy the preparations of flour, and to correct their acidity. Ammonia, or the volatile alkali, has precisely the same effect, and we suppose would answer better in some cases. The acid generated by the fermentation of gingerbread unites with the alkali and both become neutralized and consequently deprived of their peculiar taste; while at the same time the carbonic acid which was combined with the alkali, is disengaged in the form of gas, which renders the cake porous and light. A small quantity of pearlash, or soda, or volatile salts, will sweeten bread that has become sour, if mixed with it previously to baking. The sourness is caused by the process of fermentation being carried too far; or, in the language of the trade, by suffering the dough to stand to rise too long. Vinegar, which is the acetic acid, results from this excessive fermentation, and causes the bread to be sour. And the sourness is removed, as before stated, by the addition of an alkali which absorbs the vinegar. For the same reason the *sal æratus* (which is a carbonate of potash—that is, a combination of carbonic acid with potash,) is mixed with sour cider, and renders it lively on account of the carbonic acid gas separated from the salt, by the vinegar of the cider uniting to the potash.

The alkalies are constantly employed for a variety of useful

purposes, and their mode of operation never thought of. The dyspeptic resorts to soda or to soda biscuit, to correct acidity of stomach, and knows as little of its *modus operandi* as he does of Capt. Symmes' hollow. A lady destroys the color of her dress by spilling some lemonade on it, and restores it instantly with hartshorn; but she knows and cares as little about the cause of it as she does about useful studies of any kind. In short, most people are every day performing chemical experiments of an entertaining and useful nature, to which they apply their powers of reflection as little as if they were brute animals. We hope to see the day when the useful sciences shall become more fashionable—when mankind generally, (or at least Americans,) shall act as if they were conscious of the possession of intellect, and aware that knowledge and reflection may be made a fruitful source of happiness—when a *polite* and *accomplished* education will require something more than skill in the use of the fingers on the piano, and grace in the art of moving the feet in unison with music. We hope to see the day when magistrates will cease to fine pastry cooks for puttting volatile salts in gingerbread, and when editors of newspapers will cease to report as frauds such culinary operations.

Cholera in Quebec.—According to the report of the Board of Health of Quebec, it appears that from the 7th of July to the 14th of August inclusive, (thirty-nine days,) 1169 deaths have occurred in that city from this disease. Its total population is less than 30,000; and the board refrained from publishing any accounts of its effects previous to the time above mentioned, on the ground "*that it would unnecessarily foster public alarm.*" During the same space of time, 826 deaths had occurred at Montreal, from the same disease.

Origin of the word Halcyon.—Seeing in your last number a definition of the origin of this word, I send you another version somewhat different:

On the northern shores of the Mediterranean sea, there occurs annually a few days of mild weather, during the preva-

lence of which, according to ancient tradition, the ALCEDO *alcyon*, on European kingfisher, taking advantage of this happy state of the weather, crossed the Mediterranean and reared her young. Hence the "halcyon day," applied to the happy period of youth, &c. H.

Importance of Time.—One day, at the table of the king of Macedon, the conversation turned on the poetry of Dionysius the elder, when Philip asked the son of the former, what time his father could find to compose so great a number of works? "That," he replied, "which you and I pass here in drinking."

Dwarf Marriage.—On Tuesday last, the marriage of the dwarf exhibiting in this town, Don Santiago de los Santes, to Ann Hipkins, whose parents reside in Livery street, took place at St. Martin's church. The Don is 48 years of age, and about 25 inches high; and Miss Hipkins is 28 years of age, and about 40 inches high. The Rev. Mr. Foye performed the marriage ceremony, and the High Bailiff had the honor of giving the lady away. The bride and bridegroom were brought to the church in a sedam; and, as might be expected, an immense crowd of people assembled, which it was found impossible to control without the aid of the police.—*Birmingham Advertiser.*

Sagacity of a Cat.—A few days since, a young cat, in a family in this neighborhood, who had not much experience in the feline wars, encountered an old rat, so sturdy as to defy all efforts to despatch him by the ordinary process of biting and shaking, took him deliberately to a tub of water, plunged him in, and holding him with her fore feet, drowned him. The fact was witnessed by several of the family.—*N. Haven Her.*

Great Longevity.—There is now living at Stella Path-head, a widow named Catharine Miles, of the extraordinary age of 103 years; and so active and vigorous, that a month ago she carried a stone of flour from this town to her home, a distance

of five or six miles. Her son had promised to carry her to Stella in his wherry, but she would not wait for that conveyance.—*New Castle Chron.*

Origin of the term Weathercock.—According to Bechman, vanes were originally cut out in the form of a cock, and placed on the tops of churches during the holy ages, as an emblem of clerical vigilance; hence the name of weathercock.

Large mass of Silver.—Late foreign journals state that a lump of silver was lately obtained from the silver mines of Koningsburg, probably the largest ever seen. It weighed 7½ cwt. and is estimated at the value of $13,000 specie.

NOTICES OF WORKS IN THE PRESS.

"THE JOURNAL OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, vol. vii. Part i." It is unnecessary to say much in commendation of this publication. No less than to the preceding volumes of the work, will public attention be anxiously directed to this coming record of American science. And we doubt not that it will add to the eminence of the institution from which it emanates. It will be issued during the current month.

"ANIMAL AND VEGETABLE PHYSIOLOGY CONSIDERED WITH REFERENCE TO THEOLOGY." By Peter Mark Roget, M. D. &c. &c. Carey, Lea & Blanchard.

"ON THE INFLUENCE OF VARIOUS PHYSICAL AND MORAL AGENTS, climate and locality, change of air, food, clothing, bathing, exercise, professions &c. on healthy man; constituting Elements of Private Hygiene, or the art of preserving health," 1 vol. 8vo. By Robley Dunglison, M. D. &c. &c. Carey, Lea & Blanchard.